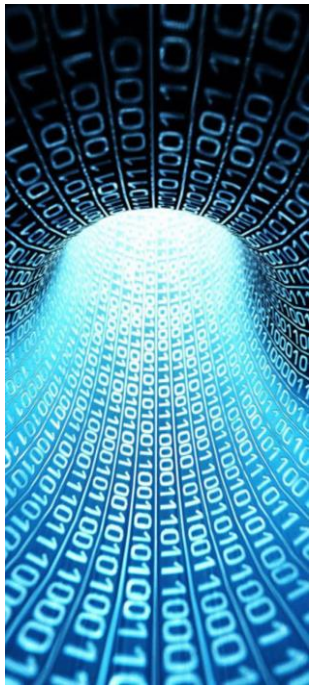
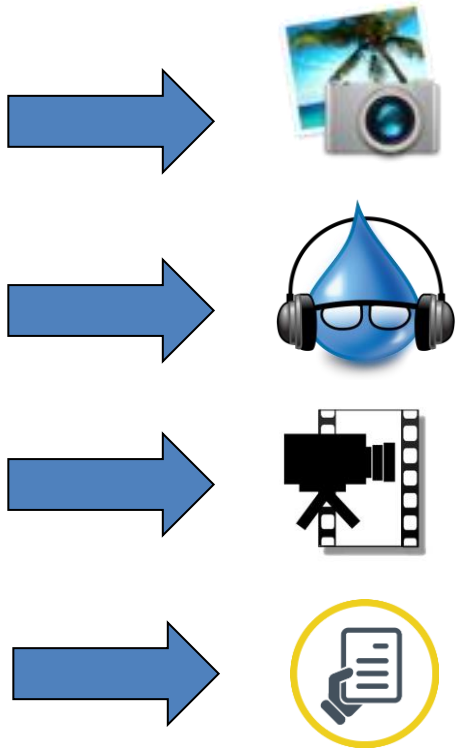
OUTPUT Peripherals

Output Devices

- Convert (digital) computer data into something useful for humans in external world:
  - Images
  - Music
  - Movies
  - Documents
- Many different types
- A few general purpose
- Mostly specialised



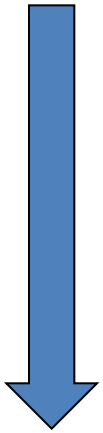


Monitor/Screen

- Used to be called a Visual Display Unit (VDU)
- Used to use Cathode Ray Tube (CRT) like old TVs
- Now flat screen like modern TVs
  - Liquid Crystal Display (LCD)
  - Plasma
  - Lower weight and size
  - Use less power
  - Do not flicker (good ergonomic feature)

Monitor/Screen

- Screen sizes vary enormously:
  - Smartphone
  - Tablet
  - Netbook
  - Laptop
  - Desktop
  - Home TV for PC



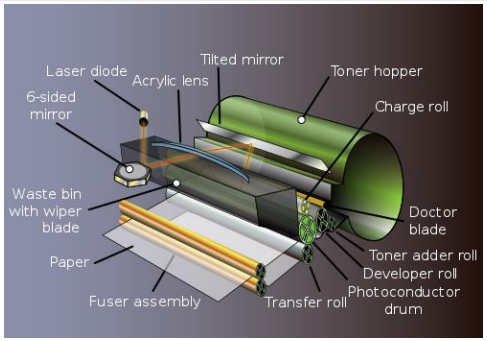
Bigger…

http://computer.howstuffworks.com/monitor.htm

Printers

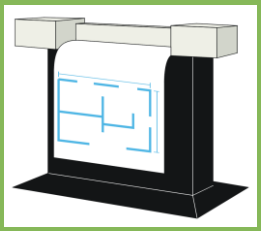
- Device for getting computer-based (digital) information onto paper
- ‘Soft-copy’ to ‘hard-copy’
- Various technology evolutions:
  - **Dot matrix:** An ‘impact’ printer, hitting an inked ribbon on to the paper. Obsolete now.
  - **Inkjet:** Squirts jets of ink onto paper - very fine control available. Multiple ink colours available and cheap to buy. Can be expensive to run (ink cartridges) but good for home use (photo printers) & small offices.

Printers



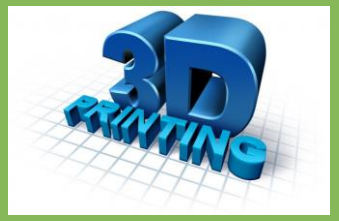
- **Laser**
  - High resolution (fine detail)
  - Non-impact - similar to photocopiers
  - Rotating mirror directs laser on light sensitive drum
  - Drum gets electrostatic charge where laser hits
  - Drum picks up toner on electrostatic charge
  - Charged paper rolled against drum picks up toner
  - Paper heated to melt toner
  - Reliable, fast and getting cheaper all the time

Plotters



- Uses vector or co-ordinate (x-y) graphics to drive pens over paper or uses inkjet technology over much larger than standard paper
- Excellent for detailed drawings and plans
- Good for very large sheets
- Specialist applications like:
  - Architectural drawings
  - Digital mapping
  - Engineering drawings

3-D Printing



- An extension of (2-D) x-y plotters
- Uses three dimensions (x-y-z)
- Allows ‘rapid prototyping’ of physical d
- Avoids traditional manufacturing processes during early design and development stages
- Saves a lot of time and money

https://3dprinting.com/what-is-3d-printing/

Other Output Devices

- Speakers
  - Normally built-in
  - Can connect higher-quality ones externally

- Headphones
  - Wired
  - Wireless

STORAGE Peripherals

Storage Devices

- Has different names:
  - Secondary storage
  - Backing storage
  - External drive
  - Portable drive
- Non-volatile (retains data in absence of power)
- Capacity now measured in:
  - GB (Gigabytes)
  - TB (Terabytes)

Floppy Disks

- Very small capacity (1.44MB)
- Very slow
- Obsolete - new computers do not have floppy drives!

External Hard Disks

- Also known as HDD (Hard Disk Drive)
- Just like the internal hard disk – only external!
- One or multiple platters (disks) made of aluminium or glass
- Coated in a magnetic material
- A read/write head per side of disk
- Heads move together to tracks on the disk and read in succession giving “cylinders”

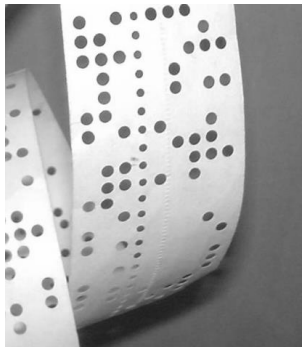
External Hard Disks

- All sealed to keep dust out
- Delicate
- Very fast
- Very high capacity
  - Terabytes (TB)
- Low cost per byte

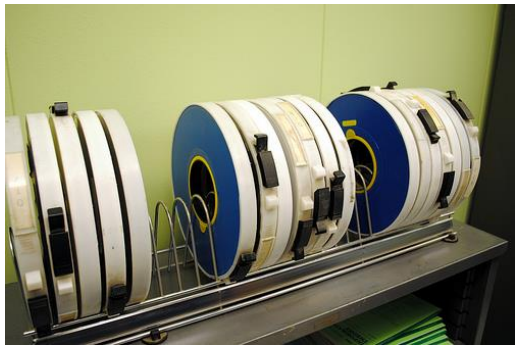
http://computer.howstuffworks.com/hard-disk.htm

Tape Drives

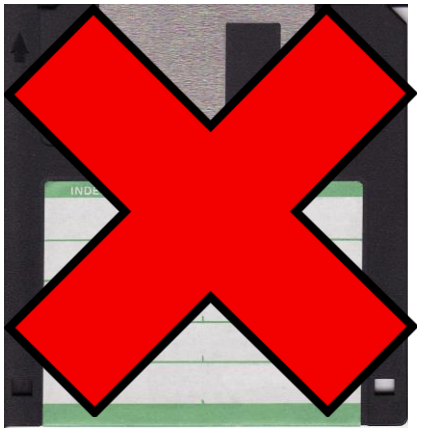
- Used for very large capacity backup
- Inexpensive on *cost-per-unit storage*
- Complex to set-up and manage
- Large companies only



See notes below…



Memory Stick



- Also known as:
  - USB Drive
  - Pen Drive
  - Flash Drive
- Killed-off the floppy disk
- Uses solid state ‘flash’ memory
- All electronic – no moving or mechanical parts
- Non-volatile (retains data in absence of power)
- Quick read/write performance
- Capacity constantly increasing

Memory Stick

- Small and highly portable
- Great for moving data between machines
- Competing with ever smaller HDD!

  http://computer.howstuffworks.com/flash-memory.htm

Communications Peripherals

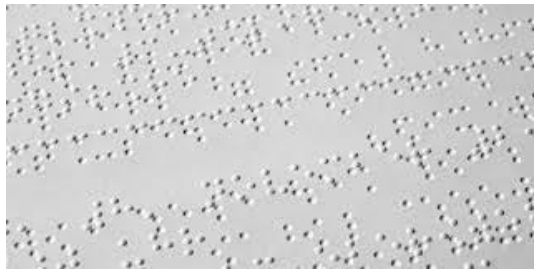
Communications Peripherals

- A number of communications devices are available as peripherals or built in components.
- Most peripheral communications devices based on plug-in USB packaging…
  - USB Wired Ethernet
  - USB Wireless Ethernet
  - USB Modem
  - USB Bluetooth

- Can also regard the combined home switch/router/firewall/ADSL modem as a peripheral

Devices for the people with Disabilities

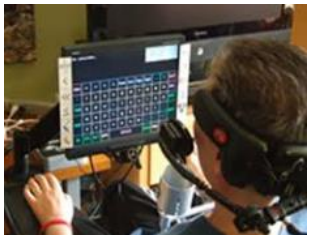
- For blind & visually impaired users:
  - Braille keyboard & Braille printer
  - Microphone & voice recognition software
  - Can drive the computer and dictate text
  - Loudspeaker & text-reading software
  - Screen magnifier



Devices for the people with Disabilities

- For physically-impaired users:
  - Mouth stick
  - Puff-suck switch
  - Tongue-activated joystick
  - ‘Eye-typing’ device
  - Foot mouse






Connecting Peripherals

- For wired connections:
  - Universal Serial Bus (USB) cable
  - http://www.usb.org/home
- For wireless connections:
  - Bluetooth
  - https://www.bluetooth.com/

References

- https://www.computerhope.com
- http://www.howstuffworks.com/
- http://www.computinghistory.org.uk/

Awarding Great British Qualifications

Topic 4 – Peripherals and System Building

Any Questions?